Combined Test Bed (CTB) Distributed Engineering Plant (DEP)

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Tactical Data Systems Overview
SSC San Diego Code 245

Tactical Data Systems Overview
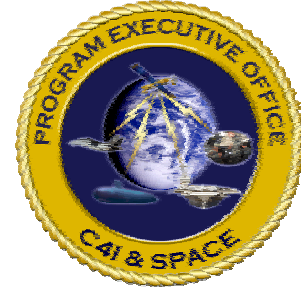# Past and Present

Operational Relevance

- Missile Defense Systems Exerciser (MDSE) TADIL Lead
- Battle Group Systems Integration Testing (BGSIT) Establishment/Support since (1994)
- JTIDS Network Library (JNL) Validation
- CEC/TADIL Interoperability Lead for CEC DT/OT
- JTIDS Shipboard Antenna development and fielding (AS-4400, AS-4127/A)
- BMDS Testbed San Diego

SSC San Diego Accomplishments

- Key in the development of Link-11
- Lead Navy center for Link-16
- Developed Command and Control Processor (C2P)
- Developed Common Data Link Management System (CDLMS)
- JCIET and JADO/JEZ support
- TADIL Lead for Navy Distributed Engineering Plant (BG Shore Testing)

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Recent CTB Joint Testing

- MIDS FAQT LRIP 1 Vendor Government Qualification Testing
- F/A-18 MIDS DT/OT work-up evaluations
- MIDS LVT DT-T2 Navigation Testing
- Time Critical Strike Operational Thread Demonstration (Multi TADIL Capability)
- Common Link Interface Processor (CLIP) Joint Development
- ADSI Developmental Testing
- Multi-TADIL Capability (MTC) Testing
- Joint Interoperability Testing
- ALS, ALUC, ITA Testing
- MDSE Testing
- Rosetta Testing
- JTIDS/MIDS RELNAV Testing
- NATO Simple Protocol Testing
- Dynamic Network Controller Testing
- OASIS Testing
- Joint Range Extension (Satellite TADIL-J)
- DEP DT-801 (Joint & Coalition)
- IF10 for BMD Ground Based Mid Course Defense
- FM 5&6 for BMD

Recent CTB Navy/NATO Testing

- – JTIDS Network Library (JNL) Validation Testing
- – Submarine STJ Testing
- – JTIDS/MIDS RELNAV Testing
- – EA-6B Testing
- – MIDS On Ship (MOS) Testing
- – MK2 Ship Self-Defense System (SSDS) Testing
- – E2C TSR/NTR Network Testing
- – CDLMS FIT
- – DEP/Network STJ Rehost C2P Validation

- – NATO Simple Protocol Testing

Tactical Data Systems Overview
Combined Test Bed

Hardware in the Loop
- ACDS/C&D
- Access to SSDS
- Tactical data links

Operational Software
- Integration expertise
- Experienced support for extensive live and simulated testing

Shipboard JTIDS Terminals

Fleet "Live" Operations JTIDS Antenna

C&D, ACDS and C2P Processors

E-2C Test Facilities

MIDS LVT Terminals

F-14D Lab
F/A-18 Lab

Shipboard CIC Systems

Tactical Data Systems Overview
Live Joint Testing Examples

Pedro Tower
Antenna Site

OE-82 Antenna Group

Link-16 DT & OT

Link-16
Mini-Rack System

- Extensive OTH Comms DT & OT
- AEGIS Model 5 801 DT&E
- AEGIS CSQTT Testing
- AEGIS testing (BL 6)
- CEC Road to OPEVAL
- Roving Sands
- Coral Talon
- BGSITs, Fleet Exercises
- AIT Installation Support
- JSCIET/ASCIET/JIADS

Helical SATCOM
Antennas

Bldg 600 Antennas

Multi-Link and CEC Capability

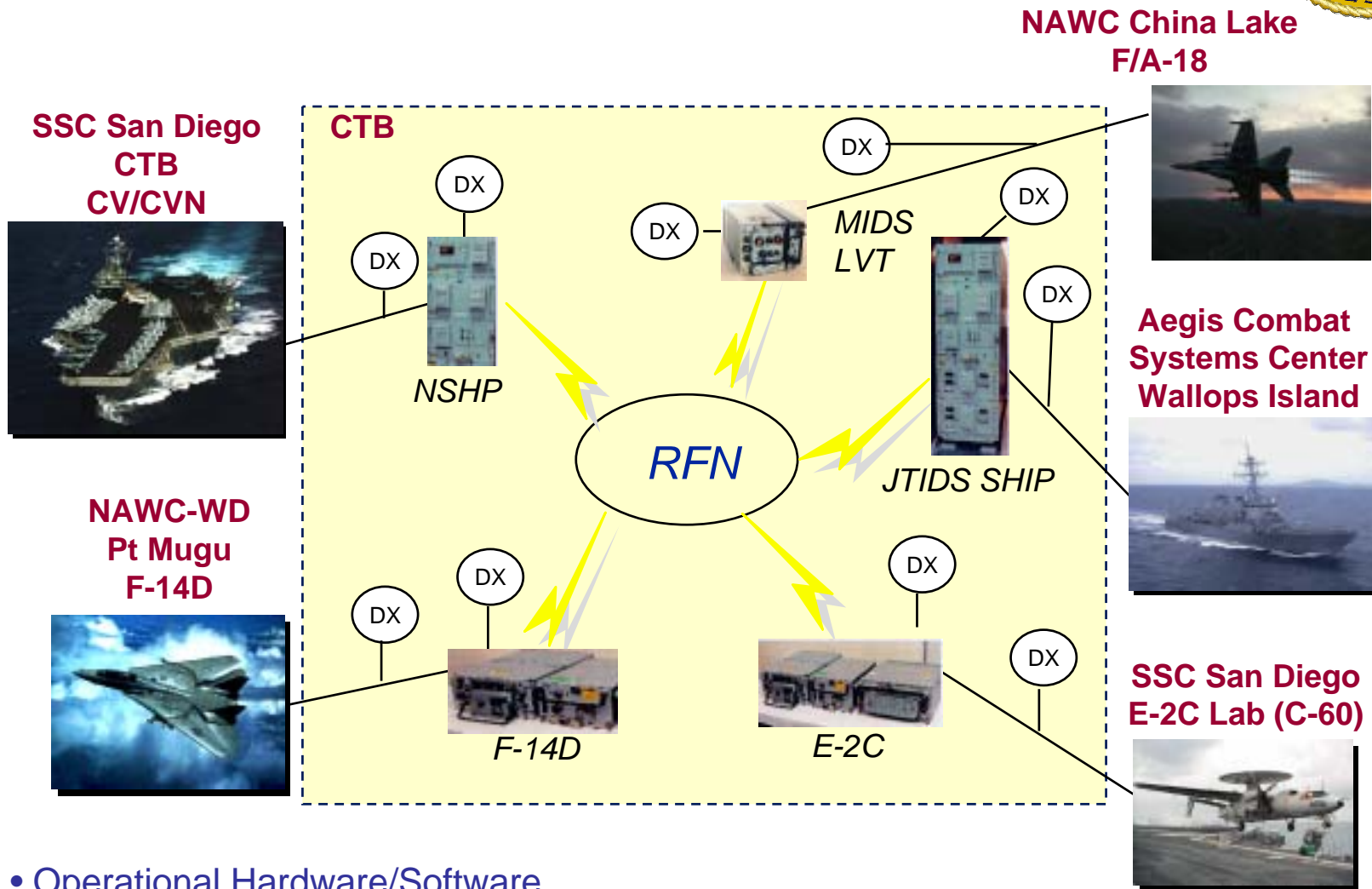Live CEC, Link-16 and Link-11 to the
Fleet from Buildings 600 and C-60

MIDS Minirack (NAS Lemoore)

Tactical Data Systems Overview
Typical CTB SG Connectivity

NAWC China Lake F/A-18

SSC San Diego CTB CV/CVN

NAWC-WD Pt Mugu F-14D

Aegis Combat Systems Center Wallops Island

SSC San Diego E-2C Lab (C-60)

CTB

DX — *NSHP*

DX — *MIDS LVT*

DX — *JTIDS SHIP*

RFN

DX — *F-14D*

DX — *E-2C*

- Operational Hardware/Software
- Remote phone line connectivity via Data Link Gateway
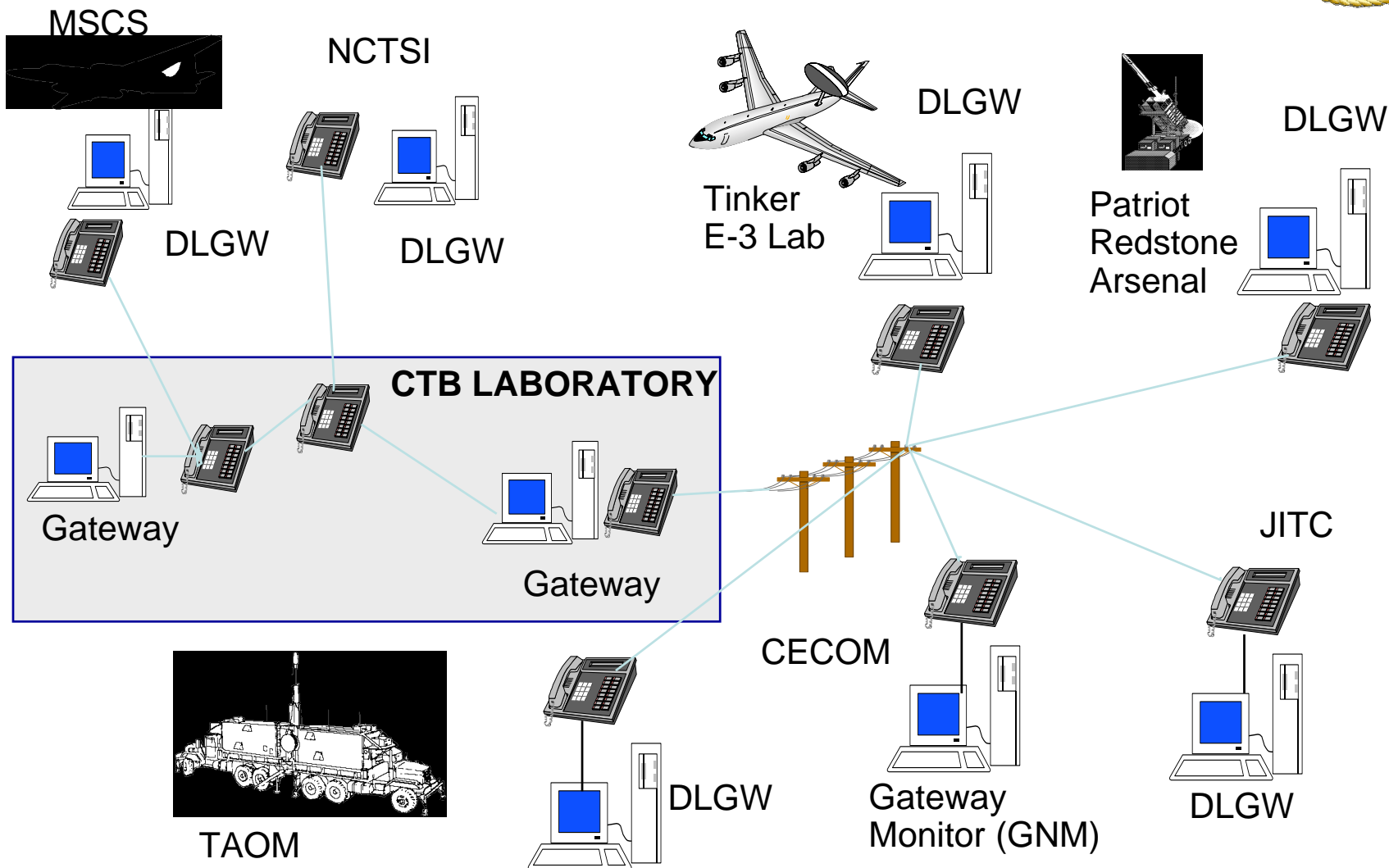
Data Link Gateway (DLGW)

- Capabilities
  - Modes of Operation
    - Virtual Host/Virtual Terminal (GVH/GVT)
    - Gateway Terminal Emulator (GTE)
    - Gateway Host (GH)
    - Gateway Network Monitor (GNM)
    - Data Terminal Set Emulation (NTDS, ATDS)
  - Variety of Host Interfaces Support
    - MIL-STD-1553B Navy (GTE,GH,GVH/GVT), F-15 (GH, GTE), MCE (GH,GTE))
    - X.25 (2M GTE)
    - Class 2H E-3 Interface (GH, GTE)
    - NTDS, ATDS - Link-11
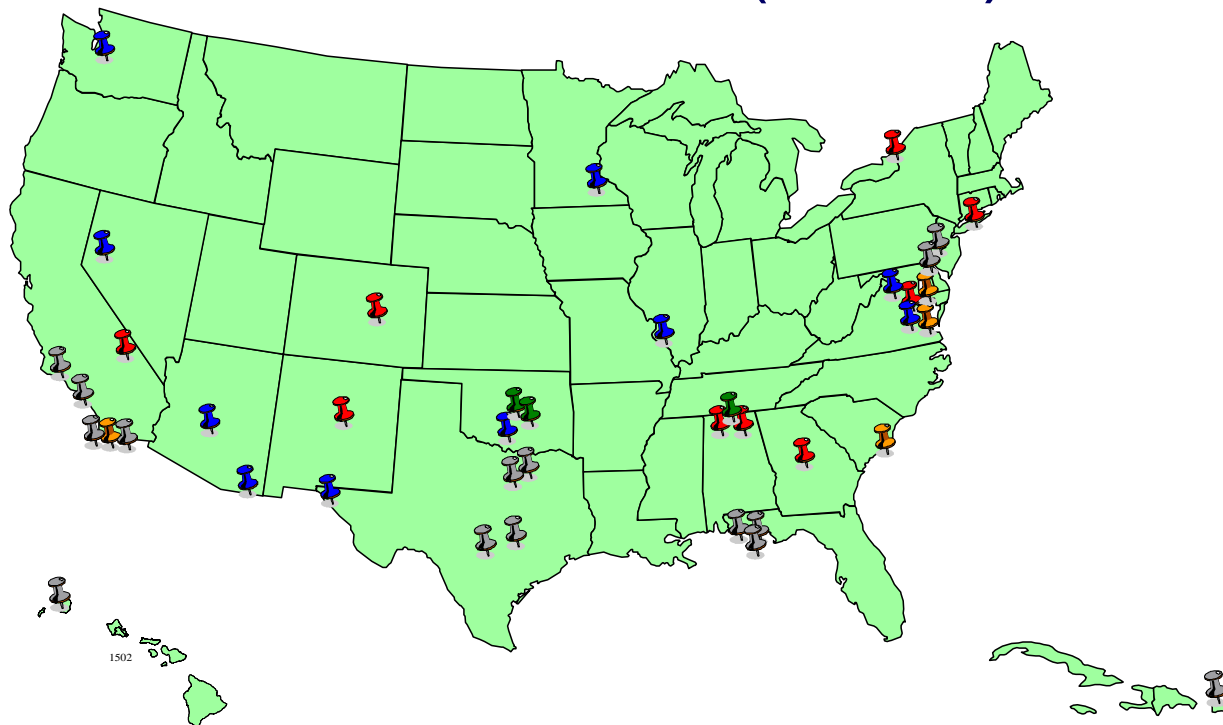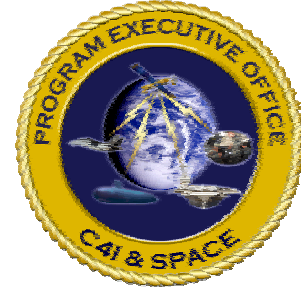 - Data Replay
  - Geographic Situation Display

Tactical Data Systems Overview
Joint I/O Link-16 Connectivity

MSCS

NCTSI

DLGW

DLGW

Tinker
E-3 Lab

Patriot
Redstone
Arsenal

DLGW

DLGW

CTB LABORATORY

Gateway

Gateway

JITC

CECOM

TAOM

DLGW

Gateway
Monitor (GNM)

DLGW

Tactical Data Systems Overview
Datalink Test Tools (DLTT)

DEP

- NSWC Dahlgren
- AEGIS ACC, Dahlgren, VA
- AEGIS ARTC, Dahlgren, VA
- NAWC, Patuxent River, MD (E2C)
- SSC Charleston, SC
- NSWC Dam Neck, VA
- SCSC Wallops Island, VA
- NSWC (DOC) Dahlgren, VA
- SSC-SD E2C LAB, CA
- ICSTF SSC-SD, CA
- NAWC Pt. Mugu (F-14 LAB), CA
- EC SPARES (DOC - Dahlgren, VA)
- RN, Portsmouth, UK

TMDSE

- USMC TMBD, Syracuse, NY
- PATRIOT SITE, Ft. Bliss, TX
- JTAGS, Azusa, CA
- TBE, Huntsville, AL
- TACCSF, Kirtland AFB, NM
- THAAD, TMI, Huntsville, AL
- JNTF, Schriver AFB, Colorado Springs, CO
- SED, REDSTONE MISSILE ARSENAL, Huntsville, AL
- NSWC-DD, Dahlgren, VA
- ARTC, Dahlgren, VA

MIDS

- NAWC-AD Patuxent River, MD
- Boeing Aircraft Company, St. Louis, MO
- NAWC-WD China Lake, CA
- System Integration Facility, SSC-SD, CA

OTHER

- APC, Austin, TX
- CDT, San Antonio, TX
- Ft. Rucker,AL
- Hurlburt AFB, FL
- Eglin AFB, FL
- Hanscom AFB, MA
- CECOM Ft. Monmouth, NJ
- MCTSSA DET Crane, IN
- MDA St. Louis, MO
- Tinker AFB, OK
- Raytheon, San Jose, CA
- U2 LMCO, Ft. Worth, TX
- Raytheon, Boston, MA
- P3I Van Nyes, CA
- NSWC China Lake
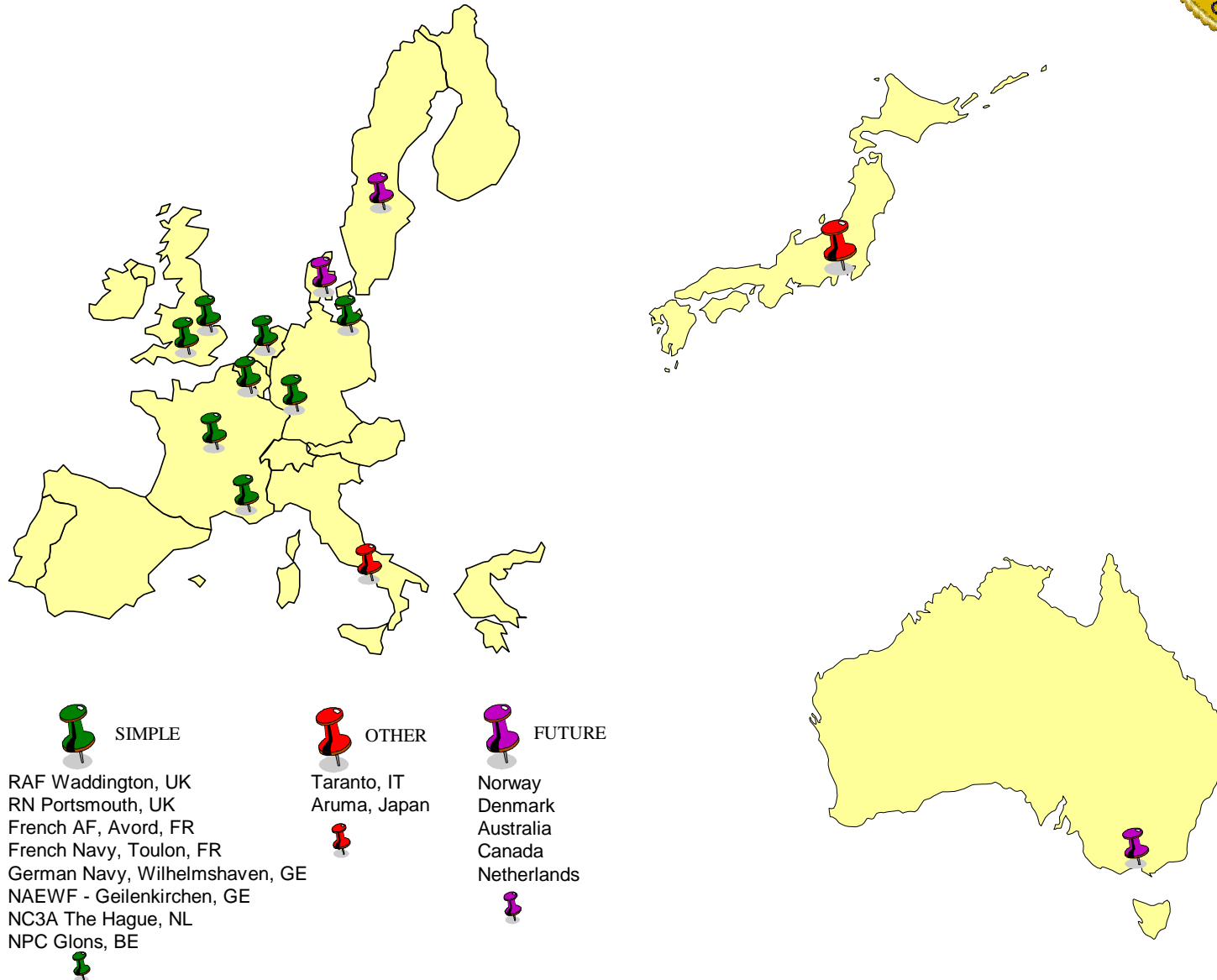- AFWTF, Ceiba, PR
- NSWC Dam Neck, VA
- NSWC Dahlgren

JIT

- JITC Ft. Huachuca, AZ
- E-3 - Tinker AFB, OK
- NCTSI San Diego, CA
- Greenville, TX
- SIS Ft Worth, TX
- SIS Falls Church, VA
- SIS Woodland Hills, CA
- MCTSSA Camp Pendleton, CA
- Redstone Arsenal, AL
- AFPTU Langley AFB, VA
- JSTARS, Melbourne, FL
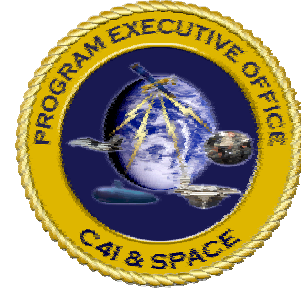
Tactical Data Systems Overview
Datalink Test Tools (DLTT)

SIMPLE

OTHER

FUTURE

RAF Waddington, UK
RN Portsmouth, UK
French AF, Avord, FR
French Navy, Toulon, FR
German Navy, Wilhelmshaven, GE
NAEWF - Geilenkirchen, GE
NC3A The Hague, NL
NPC Glons, BE

Taranto, IT
Aruma, Japan

Norway
Denmark
Australia
Canada
Netherlands

TADIL Testing Fidelity

LIVE Platform testing (Real World)

GVT/GVH/Link-16 Terminals
Potential for message loss due to stress loading, network issues and RF LOS (Relay/COE)
Actual Terminal Hardware/Firmware

GTE TSA/RELAY (host/network/metering issues) DEP Testing – Future.
Potential for message loss due to stress loading and network issues
Emulated Terminal Firmware

GTE TSA (host/network/metering issues) Accredited/Used for DEP Testing
Potential for message loss due to stress loading and network issues
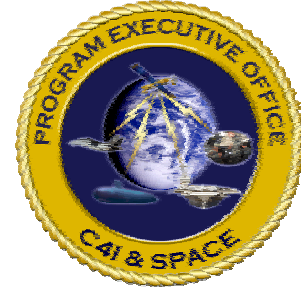**Emulated Terminal Firmware**

GTE non-TSA (host issues) DEP Testing
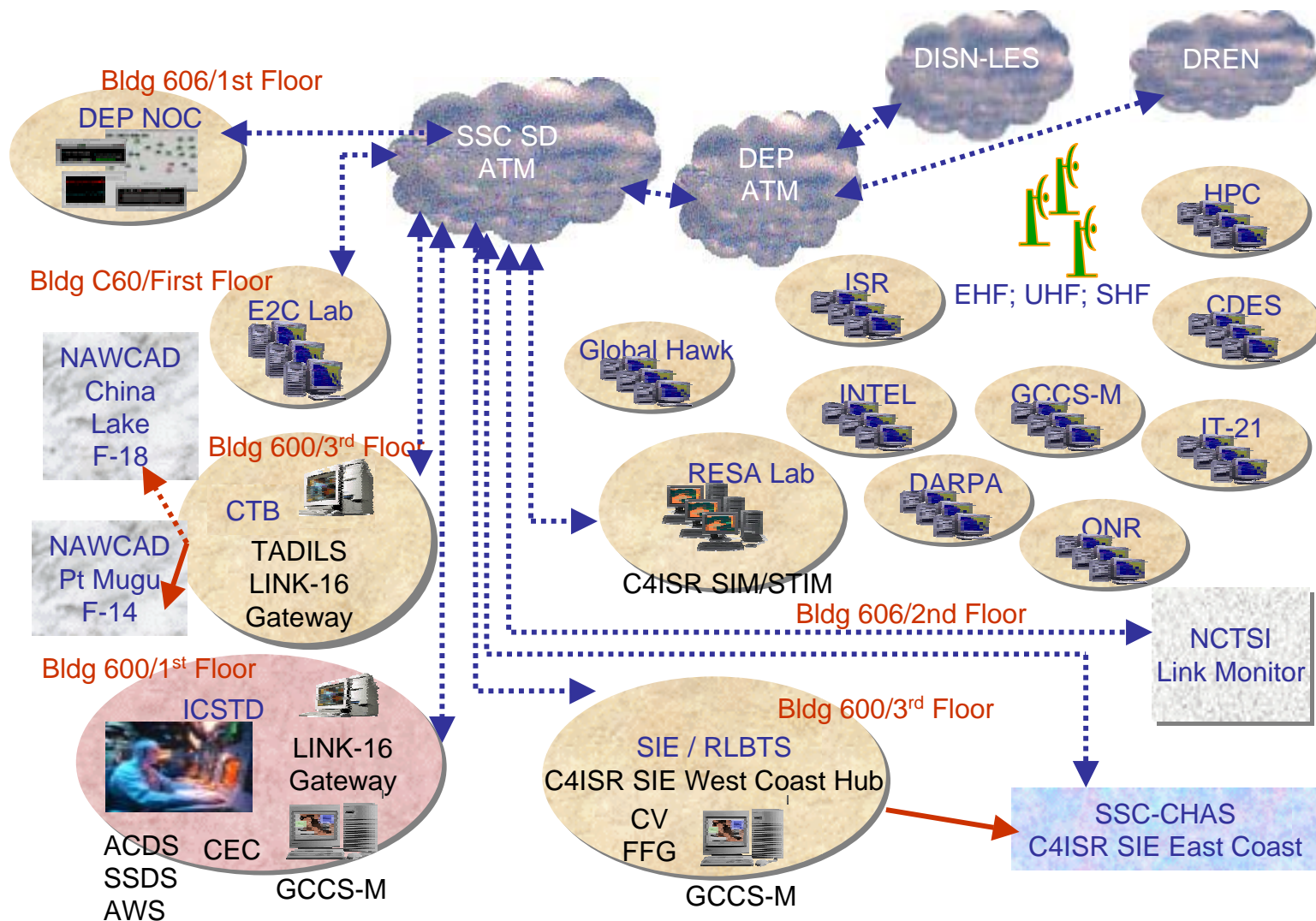**100% connectivity**
Emulated Terminal firmware

Tactical Data Systems Overview
TADIL Team Support

**FARP Support
TADIL Representation
C2P SSA Representation**

**Post-Test Analysis
C2P SSA Support
DCMC Membership**

**Test Execution Support (TOC)
TADIL Troubleshooting, Config Support, & Monitor
C2P SSA Support**

**Test Planning and Procedures
Test Planning Working Groups
Plant TADIL Caps & Config
DMAP Inputs – GTE, C2P**

Tactical Data Systems Overview
San Diego Test Capability

Navy DEP Network – 2003

SPAWAR Systems Center San Diego

F-14D
NAWCWD PT Mugu

Transitioned To JDEP - 2002
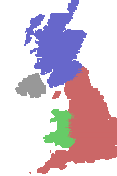
AWACS
Boeing

DEP Operations Center
NSWCDD

AEGIS Ships
ACC Dahlgren

Type 42 Destroyer
UK – Portsmouth
Future

Future

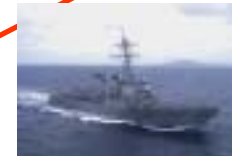**Battle Group LINK Monitor**
NCTSI

F/A-18
NAWCWD China Lake

AEGIS Ships
ATRC Dahlgren

E-2C G2 / Hawkeye 2000
NAWCAD PAX River

SSN Subs
NUWC Newport

E-2C G2, C4ISR, Tactical Data Links
SSC-San Diego
CTB, TOC, RLBTS, RESA, E2C

DEP

AEGIS SHIPS SSDS
SCSC Wallops Island

DEP Network Operations Center
SSC-San Diego - NOC

CV / CVN Class Ships LHD Class Ships
ICSTD - San Diego

Transitioned To JDEP - 2002

PAC-2
Huntsville

FFG-7 Class Ships DD-963 Class Ships CV / CVN Class Ships
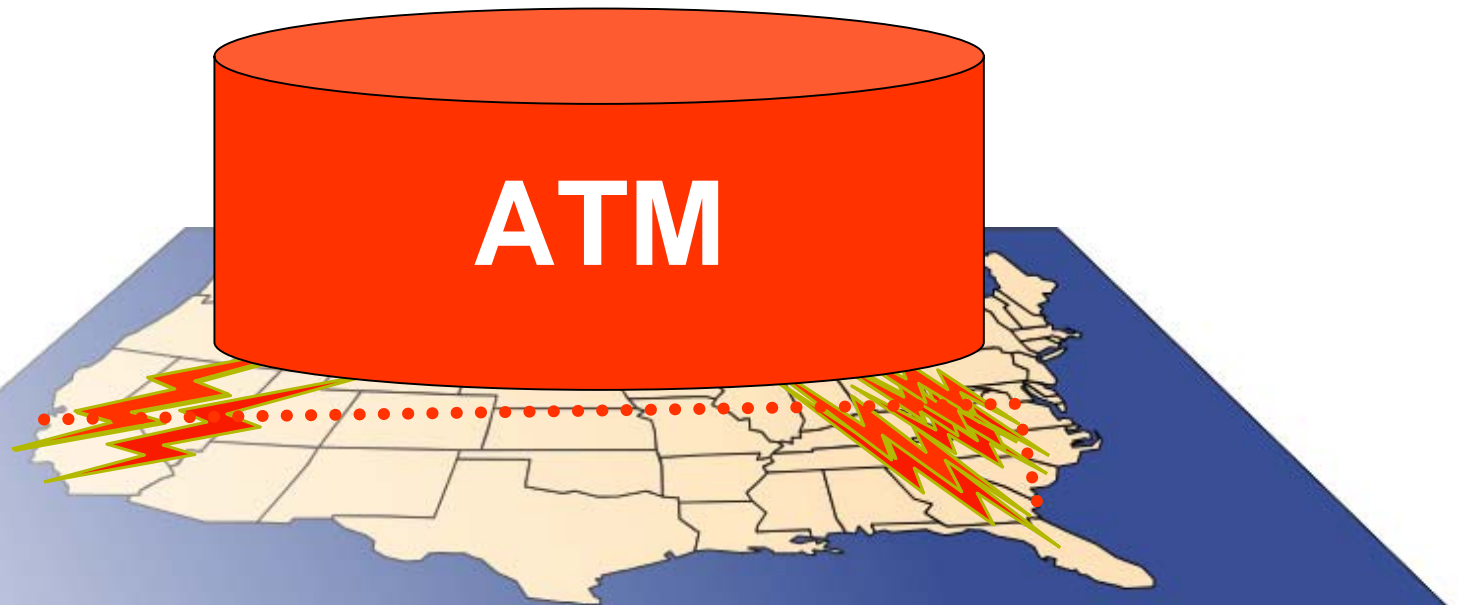CDSA Dam Neck

ATM DEP Network

DIS = Platform Sensor Input (Ground Truth)

JDN= LINK 11/16/4A Tactical Data Links

JCTN = Cooperative Engagement Capability

JPN = GCCS-M, Voice, VTC, FTP, etc.

ATM

ATM Network Provides Transport for All Data Types

Tactical Ops Center (TOC)

- C2P, TADIL Tool config support & T/S
- Real Time, Online TADIL network and message monitoring IAW TP&P
- Work w/DOC,NOC for Network issues
- Collect and respond to C2P TORs
- Collect and respond to plant TORs
- Monitor DIS for TADIL correlation
- Provide E-2C sim front end

Network Ops Center (NOC)
Joint Participation

- JDEP Activities:
- Supported JCMD (Joint Cruise Missile Defense) JDEP test
- Attended JCMD technical design workshop
- Supported NJTE (Navy Joint Test Event)
- Participated in the JDEP Technical Working Group and was selected to be a prime member of the JDEP Networking Sub-Working Group
- Working with JPO and JDEP to test QoS across DISN-LES, DEP and JDEP sites
- Working with JPO and JDEP to evaluate new VTC capability across DISN-LES, DEP, and JDEP sites
- Other Joint Activities:
- Supported the Joint National Training Center (JNTC) project in network traffic monitoring and capturing during its major testing event in Jan 04

C4ISR & DEP/JDEP

- Provide the C4ISR Node to the DEP/JDEP

- Configure and tested FOTC Coordinator and Participant roles, and BGDBM compliance.

- Perform data capture and recording on all C4ISR interfaces for post test analysis and reconstruction.

- Responsible for Passive Link Tap Configuration Management.

- Connect to Combat Systems via CSI and NTDS interface (ACDS Block 0, ACDS Block 1, AEGIS AWS)

- Connect to CAOC in Hanscom via COP Synch Tools (CST) to test TBM capabilities and share Common Operational Pictures between the Navy and AF

- SIM/STIM DIS PDU network Established

- Provided C4ISR data injection and simulation of NAV interfaces.

Tactical Data Systems Overview
PEO (C4I&S) 101/159 POCs

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Tactical Data Systems Overview
Code 245 POCs

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Questions?